In our protocol, patients are all studied at home with a combination of questionnaire response and peak flow measurements taken 3 times daily before and after the bronchodilator. The regime we use is as follows:

Week One —Normal therapy;
Week Two —Salbutamol via Spacer;
Week Three—Salbutamol via Nebulizer;
Week Four —Ipratropium bromide via Spacer;
Week five —Ipratropium bromide via Nebulizer;
Week Six —Ipratropium bromide and Salbutamol via Nebulizer.

This is sometimes varied with reference to the patients individual problems. Patient compliance with this procedure is good and the home visits give the specialist nurses the opportunity to cover many other aspects of education and advice about management of their condition; regular contact continues to be made after the trial is completed.

Referrals for such assessments are mainly from the Chest Physician. Other consultants in the hospital and general practitioners can also refer, but guidelines sent out by the local Chest Consultant make it clear that adult patients severe enough to be considered for nebulizer therapy should ideally be assessed at the hospital, although not necessarily followed-up there.

During the 3 yr audit period of 1990–1993, there were a total of 80 nebulizer trials undertaken. Of these, 30% had improved using a nebulizer with salbutamol, 4% improved with nebulizer with salbutamol and ipratropium bromide, 22% improved with salbutamol by large volume spacer and 9% showed an inconclusive result. The rest felt that conventional inhaled dosage was just as good as any of the others.

We would entirely endorse the conclusions of Hall *et al.* (1) that a nebulizer service run totally by a respiratory nurse specialist team is not only feasible, but desirable. We think that it is also efficient not only in ensuring patients are on the right treatment, but in also avoiding unnecessary expensive provision of nebulizer compressors where they are not useful.

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Dear Editor

'Ethnic discounting' and spirometry

In their recommendations concerning the measurement of respiratory function, the BTS/ARTP (1) has suggested that prediction of FEV_1 and FVC in individuals of African descent may be made more accurate by discounting 10% from values derived from ECCS reference equations (2). With our heterogeneous population in South Africa, we have had sufficient reason to thoroughly evaluate the usefulness of similar recommendations. I believe that ethnic discounting contributes nothing useful to the accuracy of predictions.

Any clinician seeking greater accuracy in predicting an individual's lung function could, with equal authority, enquire after the individual's birth weight, parental socio-economic status, maternal smoking or other known determinants of adult spirometry. If African ethnic origin is still going to be accounted for, then it is useful to know that significant variation in observed normal spirometry has been reported between African populations (3). Highest values have been reported from countries at higher altitudes such as Ethiopia and South Africa. Lower values have been reported from West Africa and the Caribbean. More recent studies have reported higher values, possibly as a consequence of secular trends. Although values reported from European populations are generally higher, there is considerable overlap in the values reported from African and European populations.

Interestingly the BTS recommendations represent a change from usual previous practice in the U.K. In a questionnaire survey conducted in 1990, respondents at university-affiliated pulmonary function laboratories (PFL) were asked how they would predict spirometry in clients of African ancestry (4). From the U.K., 10 out of 13 PFL replied that they would use reference equations based on a study carried out more than 20 yr ago in the Caribbean (5). From France, 10 out of 11 PFL replied that they would use the ECCS prediction equations without any correction factors. At that time ethnic discounting appeared to be an American practice. Eighteen out of 35 U.S.A. PFL stated that they would usually apply correction factors to their reference equations. Sixteen respondents from the U.S.A. would not apply a correction factor, and 1 PFL used an ethnically-specific prediction equation.

Usual U.K. practices for predicting spirometry in Africans may be in need of an update. Given the variety of possible choices on what to recommend, it would be interesting to know why the BTS/ARTP

specifically chose to recommend a 10% discount on ECCS values. Is this a 'rule of thumb', a repetition of long-established but poorly substantiated dogma? What was the empirical basis of the recommendation. In reviewing literature related to this subject, I have found little recent published information on spirometry or anthropometric studies of U.K. immigrants who trace their ancestry to Africa. Have there been secular effects such as those observed among Japanese immigrants into Hawaii (6)?

Prediction of lung function in Africans may seem a subject of relatively minor importance in the U.K., but it is important to remember that recommendations from prestigious bodies such as the BTS/ARTP could be uncritically or over-literally interpreted in other countries. In our own PFL, servicing an ethnically heterogeneous population, we have chosen to use uncorrected ECCS reference equations for everyone. This has proven to be perfectly adequate for usual clinical purposes.

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Dear Editor

The time-table of tuberculosis

In their Editorial in the August edition of *Respiratory Medicine*, Rubilar *et al.* (1) state the need to extend the often cited 'time-table of tuberculosis' of Wallgren (2) in the U.K. and other countries where most patients are adults with reactivation disease.

At the present time, about one-half of the tuberculosis patients in Southeast England are from ethnic minorities, the great majority being of Indian subcontinent (ISC) origin. The ISC patients differ from white patients in several respects. They tend to be much younger (median 34 years) than white patients (median 55 years), and non-respiratory forms of tuberculosis occur relatively more frequently, with the exception of genito-urinary (GU) disease which occurs less frequently (3,4). We have therefore evaluated these ethnic differences in the light of Wallgren's time-table by examining the data on 4093 and 3567 isolates of *M. tuberculosis* from patients with European and ISC names, respectively, submitted to the PHLS Regional Centre for Tuberculosis Bacteriology, Dulwich, between 1984–1991 (3).

The numbers of patients with meningitis, disseminated disease, which is now often HIV-related in this region (3), and pleural effusion were too small to permit a meaningful statistical analysis. Lymphatic tuberculosis was common, particularly in the ISC group, but was not mentioned by Wallgren. Therefore we have considered pulmonary, skeletal and GU tuberculosis.

Wallgren's fourth stage, lasting between 1–3 yr after primary infection, is characterized by skeletal and post-primary pulmonary lesions. The incidence of skeletal tuberculosis was much higher in the ISC group (8·6% of cases) than in the European group (3·5% of cases; $P<0·001$) and this trend was very similar in all age groups. The median ages of ISC patients with pulmonary and skeletal tuberculosis were 33 years and 35 years respectively. The proximity of ages of those with pulmonary and skeletal disease suggests that some of the ISC patients are in Wallgren's fourth stage. This stage precedes that of GU tuberculosis which was not analysed by Wallgren as he had very few such patients, but was shown by Ustvedt (5) to mainly occur 6–10 yr after the primary infection. In our series, GU tuberculosis in the ISC population occurred in a significantly older group (median 42·5 years; $P<0·001$). As these patients are, on average, 8–10 yr older than those with the other forms of the disease, this accords well with the sequence described by Ustvedt.

The pattern of age distributions of the different types of tuberculosis in the European group was substantially different. The median ages of patients with pulmonary and GU tuberculosis were similar,